Amendment to the Claims:

32. (Currently amended) A method of transforming a beam of electromagnetic radiation, comprising:

providing at least one optical element that includes a first and a second aspherical, non-planar, non-reentrant surface;

directing an input optical beam of substantially non-uniform intensity onto the first surface, wherein the intensity profile of the input beam is expressible as a first function of a first coordinate times a second function of a second coordinate, the first and second coordinates being independent of each other, and wherein each of the surfaces has a sag value that is expressible as a sum of contributions that depend on the first and second coordinates, respectively; and

transforming substantially all of the input beam into an output beam that propagates away from the second surface, said aspherical surfaces selected to perform said transforming, wherein the output beam includes a central region over which the optical intensity is substantially uniform, the central region including most of the optical power in the output beam, the intensity of the output beam outside the region varying gradually to substantially reduce diffraction effects.

33. (Original) The method of Claim 32, wherein said at least one optical element includes a first and a second optical element, each of the first and the second optical

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elements having at least one aspherical, non-planar, non-reentrant surface, the method further comprising aligning the first and the second optical elements along an optical axis.

34. (Original) The method of Claim 32, wherein:

the first and second coordinates are orthogonal spatial coordinates; and

the intensity of the output beam outside the central region varies gradually to substantially reduce diffraction effects.

35. (Original) A method of designing an optical system for transforming a first optical beam to a second optical beam, the first and second optical beams having respective intensity profiles, comprising:

expressing the intensity profile of the first optical beam as a first function times a second function;

expressing the intensity profile of the second optical beam as a third function times a fourth function, wherein each of the first and third functions are functions of a first spatial coordinate, each of the second and fourth functions are functions of a second spatial coordinate, and the first and the second spatial coordinates are orthogonal to each other;

defining an optical axis along a spatial coordinate orthogonal to the first and second spatial coordinates along which two aspherical, non-planar, non-reentrant surfaces are to be aligned;

constructing a ray-tracing function for the first spatial coordinate using the first and third functions;

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constructing a ray-tracing function for the second spatial coordinate using the second and fourth functions; and

using the ray-tracing functions to calculate sag values for each of the surfaces, wherein each sag value is expressible as a sum of contributions that depend on the first and second spatial coordinates, respectively.

36. (Original) The method of Claim 35, wherein the first and the second surfaces form part of first and second optical elements, respectively.

37. (Original) The method of Claim 35, wherein the surfaces are arranged in a Keplerian configuration.

38. (Original) The method of Claim 35, wherein the surfaces are arranged in a Galilean configuration.

39. (Original) The method of Claim 35, wherein the first optical beam is substantially non-uniform.

40. (Original) The method of Claim 35, wherein the first optical beam is Gaussian.

41. (Original) The method of Claim 35, wherein the intensity profile of the second optical beam is substantially rectangular.

42. (Original) The method of Claim 35, wherein the intensity profile of the second optical beam is substantially uniform.

43. (Original) The method of Claim 35, wherein the second output beam has an intensity distribution selected from the distributions consisting of Fermi-Dirac, super Gaussian, and flattened Gaussian.

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44. (Original) The method of Claim 35, wherein the integrated intensity of the second output beam is at least 90% that of the first optical beam.

45. (Original) The method of Claim 35, further comprising manufacturing the optical system.

46. (New) The method of Claim 32, wherein the first and second coordinates are polar coordinates.

47. (New) The method of Claim 32, wherein the first and second coordinates are orthogonal spatial coordinates.

48. (New) The method of Claim 32, wherein the intensity profile of the output beam is substantially rectangular.

49. (New) The method of Claim 32, wherein substantially all of the input beam is transformed for any wavelength within the wavelength range extending from 257 nm to 1550 nm.

50. (New) The method of Claim 32, wherein the first and second coordinates are represented by the Cartesian coordinates x and y, respectively, and each of the non-reentrant surfaces has a two-dimensional sag curve of the form $z(x,y) = z(x) + z(y)$.

51. (New) The method of Claim 32, wherein the aspherical surfaces have deviations from sphericity of less than about 20 micrometers.

52. (New) The method of Claim 32, wherein each of the non-reentrant surfaces has a sag curve that varies monotonically in the radial direction away from an optical axis along which the non-reentrant surfaces are aligned.

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53. (New) The method of Claim 32, wherein each of the non-reentrant surfaces has an optical prescription that is given by a single integral equation.

54. (New) The method of Claim 35, wherein the intensity profile of the second beam is substantially rectangular.

55. (New) The method of Claim 35, wherein the aspherical surfaces have deviations from sphericity of less than about 20 micrometers.

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